

## CHAPTER 8

# NAVAL AVIATION SAFETY

Aircraft mishaps are unforgiving. The loss of one aircraft can cost millions of dollars. Therefore, aviation safety has been of concern since man began to fly. As a result, both civilian aerospace industries and the military have developed aircraft mishap prevention programs.

Aviation personnel are exposed to many dangerous situations. In fact, many insurance companies rate flight line operations, and in particular the flight deck environment, among the most dangerous jobs in the world. Naval aviation safety programs have existed since before World War II to reduce the danger of those jobs. These programs are incorporated into the training of all Navy pilots and aviation support personnel.

In this chapter, we discuss the following elements of the Naval Aviation Safety Program:

- Purpose of the program
- Objective of the program
- Scope of the program
- Hazard reports
- Aircraft mishaps
- Pre-mishap plans
- Mishap reports
- Mishap investigations
- Mishap investigation reports
- Mishap investigation report endorsements
- Mishap and Hazard Recommendation Tracking Program

We also discuss the command aviation safety program and shipboard aircraft safety.

### THE NAVAL AVIATION SAFETY PROGRAM

We will now discuss the purpose, objective, and scope of the Naval Aviation Safety Program. Remember, the goal of the safety program is to enhance operational readiness by reducing the number of deaths

and injuries. In addition, the aim is to reduce the losses and damage to material from accidental causes.

### PURPOSE OF THE NAVAL AVIATION SAFETY PROGRAM

The purpose of the Naval Aviation Safety Program is to preserve human and material resources. The program enhances operational readiness by preserving the resources used in accomplishing naval aviation missions.

The human resources include professional pride, high morale, physical well-being, and life itself. These resources are susceptible to damage and destruction by mishaps.

The material resources include various kinds of property, such as naval aircraft, ships, weapons, and facilities, that a naval aircraft mishap might damage. The Naval Aviation Safety Program directly supports all aspects of naval aviation.

### OBJECTIVE OF THE NAVAL AVIATION SAFETY PROGRAM

Preventing damage and injury accomplishes the purpose of the Naval Aviation Safety Program. *Hazards* are the potential causes of damage and injury. The elimination of hazards is the objective of the Naval Aviation Safety Program. Setting up an effective, aggressive, and continuous mishap prevention program helps us achieve this objective.

### SCOPE OF THE NAVAL AVIATION SAFETY PROGRAM

The Naval Aviation Safety Program encompasses all activities concerned with detecting, containing, and eliminating hazards in naval aviation. For example, these include, but are not limited to, activities involving the following areas:

- Aircraft design, research, development, testing, evaluation, procurement, modification, maintenance, servicing, and operations
- Aircraft support equipment, facilities, supplies, and weapons

- Personnel selection, training, and education
- Protective clothing and equipment
- Policies, procedures, instructions, directives, and publications

## **AVIATION SAFETY PROGRAM RESPONSIBILITIES**

We will now discuss the various responsibilities for the Naval Aviation Safety Program.

### **Assistant Chief of Naval Operations (Air Warfare)**

The Director, Air Warfare (N88), directs and supervises the Naval Aviation Safety Program. He or she conducts the program within the office of the Chief of Naval Operations (CNO).

### **Commander, Naval Safety Center**

The Commander, Naval Safety Center (COMNAVSAFECEN), advises and aids the CNO in formulating, administering, and monitoring the Naval Aviation Safety Program. In addition, COMNAVSAFECEN has the following responsibilities:

- Under exceptional circumstances, waives or changes the investigation or reporting requirements of OPNAVINST 3750.6Q.
- Reviews, evaluates, and classifies all naval aviation mishap investigation reports (MIRs).
- Ensures the adequate distribution of essential safety information received in reports required by OPNAVINST 3750.6Q.
- Maintains a repository for all reports and related data submitted according to OPNAVINST 3750.6Q.
- Directs a system for accountability of naval aircraft mishaps and mishap exposure data.
- Releases mishap data as directed by higher authorities.
- Develops and publishes procedures and standards for aircraft mishap investigation.
- In special cases, begins and conducts naval aircraft mishap investigations under the authority of CNO.

- Executes the Mishap and Hazard Recommendation Tracking (MISTRAC) Program.
- Maintains liaison with safety activities in the other armed services and with the Department of Defense.
- Advises and aids CNO in administering the Naval Aviation Safety Awards Program.
- Conducts naval aviation statistical research, studies, analyses, special projects, and compilations.
- Sponsors and provides representation for conferences, symposia, and seminars in the furtherance of safety.
- At the invitation of aviation organizations, conducts aviation safety surveys.
- Publishes naval aviation posters, brochures, literature, and safety periodicals, in support of the Naval Aviation Safety Program.
- Helps in reviewing aviation system safety engineering requirements on new systems and major changes. He or she accomplishes this by selectively serving on boards, attending conferences, and taking part in studies for design review.
- Selectively takes part in engineering proposal evaluations and maintenance feasibility inspections of new aviation production systems and equipment.
- Supports appropriate offices, commands, and agencies in preparing general or specific operating instructions.
- Acts as technical advisor on aviation safety for the development of all naval education and training courses, films, training aids, and devices.
- In selected cases, requests support for a pathological investigation from the Armed Forces Institute of Pathology.

### **Commanders of Organizations Requiring an Aviation Safety Officer**

Activities requiring an aviation safety officer (ASO) include functional wings, marine aircraft wings, marine air groups, and training wings. Also included are all activities that are reporting custodians. Commanders

of organizations with ASO billets must take the following actions:

- Assign only designated naval aviators or designated naval flight officers to the ASO billet
- Assign a graduate of the Aviation Safety School to the ASO billet
- Place the ASO billet in the organizational structure so that the ASO reports to the commander/commanding officer directly or via the safety department/section head about aviation safety matters
- Assign aviation safety as the primary duty of the person serving in the ASO billet
- Set up and maintain a command aviation safety program according to OPNAVINST 3750.6Q

### **Aircraft Controlling Custodians**

Aircraft controlling custodians must set up and maintain a command aviation safety program. The ASO manages the program. He or she also provides advice and help to subordinate commands in the conduct of their command aviation safety programs.

### **Commanders of Naval and Marine Corps Airfields**

Commanders of naval and Marine Corps airfields must perform the following functions:

- Organize and maintain a command aviation safety program
- Coordinate a command pre-mishap plan with pre-mishap plans of nearby commands
- Submit reports of aircraft mishaps occurring within their areas of responsibility
- Provide security for aircraft wreckage within their area of responsibility
- Provide requested support to aircraft mishap boards (AMBs), including wreckage recovery, transportation, and salvage
- Manage relations with local authorities, the public, and the media
- Investigate and process claims arising from aircraft mishaps

### **All Naval Aviation Personnel**

All naval aviation personnel must acquaint themselves with safety regulations and directions that apply to them and their assigned duties. They must follow established safety standards. In addition, they must report hazards and mishaps according to their command aviation safety program and OPNAVINST 3750.6Q.

### **HAZARD REPORTS**

We discussed the detection and elimination of hazards earlier in the chapter. We will now address the purpose of hazard reports (HRs) and the procedures for reporting a hazard.

#### **Purpose of Hazard Reports**

The three purposes of hazard reports (HRs) are as follows:

1. To report a hazard and the remedial action taken so that others can take similar action to eliminate the hazard
2. To report a hazard and recommend that another organization take corrective action to eliminate the hazard
3. To report a hazard so that some other organization may determine the proper corrective action to eliminate the hazard

#### **Submission of Hazard Reports**

You have an obligation to others in naval aviation to report hazards. What is a hazard? As stated earlier, a **hazard** is a potential cause of damage or injury. You must submit an HR whenever you detect a hazard. Command safety programs must encourage personnel to report hazards. If the command expects a hazard to have an effect outside the organization, it must report the hazard to higher authority.

You can send an HR by mail or message with the Naval Safety Center as the sole addressee. Activities or individuals reluctant to identify hazards derived from unique situations or circumstances may use this reporting method. COMNAVSAFECEN will protect the source of the report and distribute a sanitized report, as it believes necessary.

Reports may include recommendations for corrective action within the command. In that case, the command should communicate the mishap prevention

information to other commands who need to take the same or similar corrective action. In the case of some hazards, the reporting command may lack the expertise to formulate recommended corrective action.

Four hazards require a special HR format: bird (and bat) strikes; near mid-air collisions; physiological episodes; and embarked landing hazards. When these types of hazards occur but they do not meet the criteria of a defined aircraft mishap, you **must** submit an HR.

The quality of an HR obviously depends on the quality of the investigation into the circumstances causing the hazard. Commands can, and are encouraged to, use aircraft mishap boards (AMBs) to investigate and report hazards. Boards that investigate physiological episodes must, as a minimum, include a flight surgeon.

OPNAVINST 3750.6Q recommends that the AMBs conduct both the investigation of the hazard and the preparation of the HRs. The reporting custodian of the naval aircraft, equipment, or facility involved normally submits the report, but any naval activity that identifies the hazard can submit a report. Activities or individuals reluctant to identify hazards involving unique situations or circumstances may submit an anonymous hazard report. Send anonymous HRs by mail directly to the Navy Safety Center.

No formal deadlines are required for submitting HRs. However, in the interest of safety, you should submit all HRs with a severe risk assessment code within 24 hours following detection of the hazard. Submit all other HRs within 14 days following detection of the hazard.

Success of the Naval Aviation Safety Program depends on the submission of complete, open, and forthright information and opinions concerning safety matters. The exercise of command influence to edit, change, or in any way censor the content of reports is contrary to the spirit of the program.

### Nonprivileged Status

Do not consider HRs as privileged. HRs and mishap investigation reports (MIRs), which are privileged, are distinctly different. The investigation and reporting of mishaps, **not hazards**, strictly limits the authority for granting an assurance of confidentiality. You must take extreme care to avoid giving any impression that HRs are for safety purposes **only**. The only restriction on their use is that they are used For Official Use Only. HRs should not include personal identifiers, such as names and social security numbers, except as points of contact. Do not ask for such information if you can investigate the hazard without using such personal information.

## NAVAL AIRCRAFT MISHAPS

In chapter 3, we examined the causes and prevention of mishaps as well as reporting procedures. We will now discuss the procedures for reporting naval aircraft mishaps and identify the various injury classifications.

### Naval Aircraft Mishap Defined

What is a naval aircraft mishap? A naval aircraft mishap is an unplanned event or a series of events that comes under one or both of the following two categories:

1. Cumulative damage of \$10,000 or greater to naval aircraft, other aircraft, and property. Property damage costs include those required to repair or replace facilities, equipment, or material.
2. An injury involving naval aircraft that results in traumatic bodily harm and causes one of the following occurrences:
  - a. Death
  - b. Permanent total disability
  - c. Permanent partial disability
  - d. One or more lost workdays

Traumatic bodily harm includes a cut, burns, a fracture, or poisoning resulting from a single or 5-day exposure to an external force, toxic substance, or physical agent resulting in one of the four occurrences just listed.

### Naval Aircraft Mishap Categories

The three naval aircraft mishap categories are defined as follows:

1. **Flight Mishap (FM):** FMs are mishaps in which intent for flight existed at the time of the mishap and in which \$10,000 or greater damage to DOD aircraft occurred.
2. **Flight Related Mishap (FRM):** An FRM is a mishap in which intent for flight existed at the time of the mishap and in which less than \$10,000 damage to DOD aircraft occurred and \$10,000 or more total damage or a defined injury or death occurred.
3. **Aircraft Ground Mishap (AGM):** An AGM is a mishap in which **no intent** for flight existed at the time of the mishap and DOD aircraft loss, or \$10,000 or more aircraft damage and/or property damage, or a defined injury occurred.

MISHAP CATEGORY	SEVERITY CLASS		
	A	B	C
<b>FLIGHT MISHAP (FM)</b> ----- <b>INTENT FOR FLIGHT EXISTED, AND \$10,000 OR MORE DOD AIRCRAFT DAMAGE OCCURRED</b>	<b>TOTAL COST OF DAMAGE IS \$1,000,000 OR MORE AND/OR INVOLVES DESTROYED AIRCRAFT AND/OR FATAL INJURY AND/OR PERMANENT TOTAL DISABILITY</b>	<b>TOTAL COST OF DAMAGE IS \$200,000 BUT LESS THAN \$1,000,000 AND/OR INVOLVES PERMANENT PARTIAL DISABILITY AND/OR HOSPITALIZATION OF FIVE OR MORE PERSONNEL</b>	<b>TOTAL COST OF DAMAGE IS \$10,000 BUT LESS THAN \$200,000 AND/OR INVOLVES AN INJURY OF 5 LOST WORKDAYS</b>
<b>FLIGHT-RELATED MISHAP (FRM)</b> ----- <b>INTENT FOR FLIGHT EXISTED WITH LESS THAN \$10,000 DOD AIRCRAFT DAMAGE</b>	<b>TOTAL COST OF DAMAGE IS \$1,000,000 OR MORE AND/OR INVOLVES FATAL INJURY AND/OR PERMANENT TOTAL DISABILITY</b>	<b>TOTAL COST OF DAMAGE IS \$200,000 BUT LESS THAN \$1,000,000 AND/OR INVOLVES PERMANENT PARTIAL DISABILITY AND/OR HOSPITALIZATION OF FIVE OR MORE PERSONNEL</b>	<b>TOTAL COST OF DAMAGE IS \$10,000 BUT LESS THAN \$200,000 AND/OR INVOLVES AN INJURY OF 5 LOST WORKDAYS</b>
<b>AIRCRAFT GROUND MISHAP (AGM)</b> ----- <b>NO INTENT FOR FLIGHT EXISTED</b>	<b>TOTAL COST OF DAMAGE IS \$1,000,000 OR MORE AND/OR INVOLVES DESTROYED AIRCRAFT AND/OR FATAL INJURY AND/OR PERMANENT TOTAL DISABILITY</b>	<b>TOTAL COST OF DAMAGE IS \$200,000 BUT LESS THAN \$1,000,000 AND/OR INVOLVES PERMANENT PARTIAL DISABILITY AND/OR HOSPITALIZATION OF FIVE OR MORE PERSONNEL</b>	<b>TOTAL COST OF DAMAGE IS \$10,000 BUT LESS THAN \$200,000 AND/OR INVOLVES AN INJURY OF 5 LOST WORKDAYS</b>

Figure 8-1.-Severity class data.

### Naval Aircraft Mishap Severity Classes

The following mishap severity classes, based on personnel injury and property damage, apply to all three categories of mishaps in the preceding paragraphs.

**CLASS A SEVERITY**— A Class A mishap is one in which the total cost of property damage (including aircraft damage) is \$1,000,000 or greater or in which an aircraft is destroyed or missing. A mishap in which any fatality or permanent total disability occurs with direct involvement of naval aircraft also falls into this category.

**CLASS B SEVERITY**— A Class B mishap is one in which the total cost of property damage (including all

aircraft damage) is \$200,000 or more, but less than \$1,000,000. In addition, permanent partial disability and/or the hospitalization of five or more personnel occurs.

**CLASS C SEVERITY**— A Class C mishap is one in which the total cost of property damage (including all aircraft damage) is \$10,000 or more, but less than \$200,000. In addition, injury results in 5 or more lost workdays. Figure 8-1 lists the data for each severity class.

An occurrence resulting in a total property damage cost (including all aircraft damage) of less than \$10,000 and no defined injuries is not reportable as a naval aircraft mishap. However, it may be reported as an aviation hazard.

## Injury Classifications

There are eight injury classifications:

1. Fatal injury. This is an injury resulting in death from a mishap or from complications arising from the mishap. The length of time between the mishap and a later death has no effect on the assignment of a fatal injury classification.
  2. Permanent total disability. These are nonfatal injuries that, in the opinion of competent medical authority, permanently and totally incapacitate a person so that he or she cannot follow any gainful occupation. Additionally, the loss of, or the loss of use of, both hands, or both feet, or both eyes, or a combination of any of these body parts as a result of a single mishap will be considered as a permanent total disability.
  3. Permanent partial disability. Injuries that do not result in death or permanent total disability, but, in the opinion of competent medical authority, do result in permanent impairment or loss of any part of the body, loss of the great toe or the thumb, or an unrepairable inguinal hernia, with the following exceptions:
    - a. Teeth
    - b. The four smaller toes
    - c. Distal phalanx of any finger
    - d. Distal two phalanges of the little finger
    - e. Repairable hernia
    - f. Hair, skin, nails, or any subcutaneous tissue
  4. Lost workday. An injury that does not result in death, permanent total disability, or permanent partial disability, but results in 5 or more lost workdays (not including the day of the injury). Lost workday level injuries are further divided into major and minor categories.
    - a. Major Injury—A nonfatal injury that does not result in permanent total disability or permanent partial disability, but results in 5 or more lost workdays and requires admission to a hospital or quarters, or a combination of both, for 5 or more days. It also includes any of the following regardless of hospital status:
      - (1) Unconsciousness for more than 5 minutes because of head trauma.
      - (2) Fracture of any bone, except simple fracture of the nose or phalanges.
      - (3) Traumatic dislocation of major joints or internal derangement of the knee.
      - (4) Moderate to severe laceration resulting in severe hemorrhage or requiring extensive surgical repair.
      - (5) Injury to any internal organ.
      - (6) Any third degree burns, or any first or second degree burns (including sun-burn) over 5 percent of the body surface.
    - b. Minor Injury—An injury less than major that results in 1 to 4 lost workdays.
  5. First-aid injury. This injury involves bodily harm requiring only first aid or no treatment.
  6. No injury.
  7. Lost at sea.
  8. Missing or unknown.
- Note that both lost at sea and missing/unknown injuries are considered as fatalities in assigning mishap severity level classification.

## PRE-MISHAP PLANS

Simply put, pre-mishap plans are descriptions of who is responsible for doing what, both before and after an aircraft mishap. A command must expect, take measures for, and formulate plans for all reasonable eventualities. The command conducts periodic drills to identify any deficiencies and to evaluate coordinated execution of the plan.

You can expect pre-mishap plans to vary widely, depending on the mission, resources, environment, and personnel of the individual command. If possible, you should write pre-mishap plans that will remain valid during deployments. Include an abbreviated pre-mishap plan in a letter of instruction (LOI) or in executing instructions for detachment. You may require other changes when the command relocates. For more information on both pre-mishap plans and post-mishap plans, consult appendix 2B of OPNAVINST 3750.6Q.

## MISHAP REPORTS

We use mishap reports (MRs) to provide interested commands with information about significant naval aircraft mishaps. The MR includes preliminary information on the mishap and information on the

progress of the investigation. When appropriate, reporting custodians may use MRs to request investigative help, relief from investigative responsibilities, or extension of MIR deadlines. An MR is not used for the submission of hazard elimination information.

All classes of mishaps require the submission of an MR by telephone or by message. You must submit an initial MR by message within 4 hours for all Class A and Class B aviation mishaps. On all Class A aviation mishaps, an initial telephone report to the NAVSAFECEN is required to provide the NAVSAFECEN with timely information on the mishap and allow a mishap investigator to respond. The first amended mishap message reports for all Class A and Class B mishaps, if necessary, and Class C initial MRs are due within 24 hours.

Any naval command may submit MRs. The reporting custodian of the naval aircraft involved in a mishap normally submits the MR. However, if it is apparent that a reporting custodian will be unable to submit the required MR within the deadline, the first command that becomes aware of the mishap will submit the report.

## AIRCRAFT MISHAP INVESTIGATIONS

A naval aircraft mishap is a signal of a failure of the Naval Aviation Safety Program. It shows that hazard detection and elimination actions were not taken in time to prevent the mishap-level damage or injury. Actions must then be taken to prevent a recurrence of the mishap. We accomplish hazard detection after a mishap through mishap investigation.

### Purpose of Aircraft Mishap Investigations

The purpose of aircraft mishap investigations is to identify the cause factors of the mishap and the damage or of any injuries resulting from the mishap. Cause factors of mishaps and cause factors of injury and damage resulting from a mishap can be two different matters. However, both are the subject of aircraft mishap investigations.

Less important reasons for conducting aircraft mishap investigations include determining the extent of damage and injury resulting from the mishap. Another reason is proving the safety commitment of the organization conducting the investigation. We conduct all naval aircraft mishap investigations **solely** for safety purposes.

## Types of Aircraft Investigations

As a result of aircraft mishaps, different authorities conduct various types of investigations for different purposes. Some of the investigations conducted are as follows:

- Aircraft mishap investigations
- Interagency investigations
- Special weapons investigations
- *Judge Advocate General Manual (JAGMAN)* investigations
- North Atlantic Treaty Organization (NATO) investigations
- Naval Safety Center investigations
- Intercomponent investigations
- Naval aircraft mishaps involving fire, explosion, or damage to a ship or shore facility
- Aircraft fire on board ship

For detailed information on the types of investigations conducted, consult chapter 6 of OPNAVINST 3750.6Q.

## Mishap Investigation Responsibilities

The reporting custodian of a naval aircraft involved in a mishap is responsible for investigating and reporting the mishap. An aircraft mishap board (AMB) investigates and reports each naval FM, FRM, and AGM according to OPNAVINST 3750.6Q.

## Aircraft Mishap Boards

Each aircraft reporting custodian maintains at least one standing AMB. The appointing authority appoints the AMB members by name and in writing. Commissioned officers on active duty compose each AMB. Minimum AMB membership consists of the following four officers:

1. An aviation safety officer (ASO)
2. A flight surgeon
3. An officer well qualified in aircraft maintenance
4. An officer well qualified in aircraft operations

The senior member must be a designated naval aviator or designated naval flight officer. Additionally, one member of the AMB must be qualified in the Naval Air Training and Operating Procedures Standards (NATOPS) if the aircraft involved in the mishap is manned by an aircrew.

## **MISHAP INVESTIGATION REPORTS**

We report hazards after mishaps by submitting a mishap investigation report (MIR). These reports are important in preventing the recurrence of aircraft mishaps. Success of the Naval Aviation Safety Program depends on the submission of brief, open, and forthright information, opinions, and recommendations. The exercise of command influence to edit, change, or in any way censor the content of MIRs is prohibited since that would be contrary to the spirit of the program. Should any senior commander have a comment to make on the content of an MIR, that officer should make that comment in an endorsement of the report.

### **Purpose of an MIR**

The purpose of an MIR is to provide information needed to fix mishap cause factors. Each cause factor has three elements associated with it that precisely describe the personnel, equipment, actions/events, and reasons for the mishap. Determining the elements determines the cause factors, which identifies the starting point for remedial action. We use MIRs to report those hazards that caused the reported mishap and the damage or injury resulting from the mishap. The report also provides a means for submitting recommended corrective action that would prevent recurrence of the mishap and resulting damage or injury.

### **Contents of an MIR**

An MIR has two parts. The first part, Part A, consists of the list of nonprivileged information extracted from paragraph 10 of the MIR, the final MR message, and enclosures specified in chapter 7 of OPNAVINST 3750.6Q. Enclosures to MIRs serve two purposes. One is to provide additional data on the mishap that can be coded and entered in the NAVSAFECEN data bank or used as research material. The second purpose is to clarify points of evidence that cannot be made in the body of the MIR message. Part B is privileged. It includes a copy of the complete MIR message, Part B enclosures, and all endorsements. For further information, consult chapter 7 of OPNAVINST 3750.6Q.

## **Submitting an MIR**

Submit MIRs within 30 calendar days following the mishap. In the case of missing aircraft, submit the MIR within 30 calendar days after completion of the organized search. The originator of the MIR is usually the appointing authority of the Aircraft Mishap Board (AMB). Usually, the appointing authority is also the reporting custodian of the aircraft involved in the mishap.

You must submit MIR messages through military radio/electronic communications facilities. Send enclosures with one copy of the MIR message by mail to the Naval Safety Center.

Figure 8-2 depicts the reporting requirements for HRs, MRs, and MIRs.

## **HAZARD REPORT AND MISHAP INVESTIGATION REPORT ENDORSEMENTS**

The endorsement of both HRs and MIRs is an important step in eliminating many major hazards. Endorsements provide an opportunity for seniors in the chain of command to add their broader perspective and authority to the process of recommending corrective actions.

### **Purpose of Endorsements**

The ultimate purpose of endorsements is to eliminate the hazards described in the reports. Endorsements convey the position of the endorsers on the matters contained in the endorsed report.

## **Review of Reports and Enclosures**

The endorsement of MIRs and HRs requires careful review of submitted reports and previous endorsements. Any endorser in the chain of command who believes an investigation is incomplete or an MIR or HR is inadequate should take corrective measures. Those measures should ensure an adequate investigation of the mishap or resubmission of the report. Any endorser may get copies of specific enclosures to the MIR by requesting them from the appointing authority of the AMB.



TYPE REPORT	SEVERITY	15 MINUTES	4 HOURS	24 HOURS	30 DAYS
HAZARD REPORT (HR)	SEVERE			PRIORITY MESSAGES	
	ROUTINE				ROUTINE MESSAGE
MISHAP REPORT (MR)	A	TELEPHONE	PRIORITY MESSAGE	AMENDED AND CLASS C MISHAP REPORT PRIORITY MESSAGE	
	B				
	C				
MISHAP INVESTIGATION REPORT (MIR)	A				ROUTINE MESSAGE  (MAIL ENCLOSURES)
	B				
	C				

Figure 8-2.-General reporting requirements for HRs, MRs, and MIRs.

### Requirements for an Endorsement

Mishap and hazard report endorsements are required under certain conditions. For all Class A mishaps, endorsements go through the Naval Safety Center. For all other classifications, the mishap or hazard report is not closed until appropriate endorsements have addressed all recommendations requiring action. If the corrective action agency is in the endorsing chain, the endorsement goes through the corrective action agency. The endorsement goes through the controlling custodian when the corrective action agency is out of the endorsing chain.

Additionally, endorsements are required when directed by higher authority. Recommendations that require or request corrective action by higher authority directly imply the requirement for an endorsement or official reply from that command. The action agency for the recommended corrective action will respond by message or letter within 30 days of the controlling custodian's endorsement.

### MISHAP AND HAZARD RECOMMENDATION TRACKING PROGRAM

We described earlier in the chapter methods you use to identify and report hazards. We will now address the Mishap and Hazard Recommendation Tracking (MISTRAC) Program. We use this program to monitor corrective actions. Monitoring corrective actions ensures the completion of those actions so that a hazard cannot cause future damage or injury. Usually the detection, reporting, and correction of hazards take place within a single command, such as the controlling custodian. However, some corrective actions require reports by a subordinate, endorsement by seniors, or remedial action by an external command. The monitoring of internal corrective actions by subordinates is a prerogative of command. COMNAVSAFECEN monitors recommendations resulting from mishaps and hazards under the MISTRAC program.

All command aviation safety programs must include methods for checking the elimination of hazards. Squadron, group, wing, ship, or other command levels can identify recommended corrective actions. COMNAVSAFECEN uses MISTRAC to track completion of these actions.

COMNAVSAFECEN directs a MISTRAC program designed to track recommendations. MISTRAC files contain a record of recommendations submitted to eliminate hazards. Individual MISTRAC files include a summary of the related mishap or hazard, recommended corrective actions, endorsement(s), and summary of action taken. The responsible aircraft operations analyst maintains the aircraft model files. He or she uses those files to track recommendations to closure. Hazards excluded from MISTRAC are as follows:

- Near mid-air collisions (NMACs)
- Bird strikes
- Physiological episodes
- Embarked landings
- Mishaps and hazards not requiring endorsement beyond the unit commanding officer

When corrective action is incomplete, a recommendation becomes a mishap and hazard recommendation (MISREC) if

1. it is assigned a risk assessment code (RAC) of I or II and is favorably endorsed by a controlling custodian or
2. it is designated a MISREC by COMNAVSAFE-CEN.

Since a MISREC is considered to have a special status, it is given a separate tracking file. NAVSAFE-CEN tracks each recommendation, regardless of the RAC assigned. Closing out the referenced mishap or hazard requires the action agency assigned to submit a recommendation or MISREC. We consider recommendations and MISRECs involving incomplete action as privileged information.

Semiannually on 1 March and 1 September, COMNAVSAFECEN provides action agencies with a listing of all MISRECs under their responsibility. This listing provides information those agencies can use to update the MISREC files. This information includes the MISREC that generated the mishap or hazard summary, all endorsements, and all transactions that have taken place to the date of the report.

COMNAVSAFECEN provides a listing of all MISRECs to the controlling custodians semiannually (1 June and 1 December) to help in the overall monitoring of MISRECs. COMNAVSAFECEN also updates MISREC files based on information received from action agencies, controlling custodians, pertinent mishap data, and other DOD agencies.

## **COMMAND AVIATION SAFETY PROGRAM**

The command aviation safety program promotes aviation safety through the command's attitudes and practices as well as through written policies, procedures, and plans. The aim of a command aviation safety program is to end hazards within the command and within naval aviation. In addition, the program must enhance the safety awareness of all personnel.

Safety is an inherent responsibility of command. Thus, the chain of command carries out the program. The command must generate and carry out safety policies and directives based on instructions covering the many different types of safety programs and processes. The goal of the safety program is to enhance operational readiness by reducing personnel deaths and injuries and material loss and damage.

## **COMMAND AVIATION SAFETY RESPONSIBILITIES**

Although all aviation personnel are responsible for carrying out the command aviation safety program, certain command personnel have the primary responsibility for the program.

### **Commanding Officer**

The commanding officer of an activity appoints an aviation safety officer (ASO) as specified in the *Standard Organization and Regulations of the U.S. Navy*, OPNAVINST 3120.32C. This instruction lists the command ASO's responsibilities and how the ASO should establish the program within the command.

### **Aviation Safety Officer**

The aviation safety officer (ASO) acts as principal adviser to the commanding officer on all aviation safety matters. He or she advises and aids the commanding officer in setting up and managing a command aviation safety program. Providing safety education throughout the command is a responsibility of the ASO. He or she also ensures the incorporation of safety standards and

procedures into all activity functions. The ASO coordinates safety matters among the organization staff. He or she maintains appropriate aviation safety records and mishap statistics. The ASO must be a primary billet assignment.

The aviation safety officer and Quality Assurance/Analysis (QA/A) Division personnel, working together, develop a local maintenance instruction (MI) or command type of instruction. This instruction identifies the command policies and responsibilities of all concerned. You should consult the following publications during the instruction development process:

- *The Naval Aviation Safety Program*, OPNAVINST 3750.6Q
- *Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat*, OPNAVINST 5100.19B
- *Navy Occupational Safety and Health (NAVOSH) Program Manual*, OPNAVINST 5100.23C
- *NAVAIROSH Requirements for the Shore Establishment*, NAVAIR A1-NAOSH-SAF-000/P-5100-1

The ASO and QA/A Division personnel investigate most mishaps/incidents and hazards in their activity. OPNAVINST 3750.6Q identifies report requirements and specifies the conditions under which you report mishaps and injuries to the Commander, Naval Safety Center. To prevent mishaps and their causes, local activities should check the effectiveness of their safety program and mishap investigation and reporting procedures.

The key to having an effective safety program is effective communication at all levels of command. A variety of publications are available to the safety officer and key members in the safety program to help in the communication process. The Naval Safety Center helps to promote safety in aviation through various safety-oriented publications. They are described in chapter 1. Some of the publications available that contain current, accurate information you can use to help prevent aviation mishaps include:

- *Approach* magazine
- *Aviation Safety Bi-weekly Summary*
- *MECH* magazine

## **FUNCTIONS OF THE COMMAND AVIATION SAFETY PROGRAM**

Sound, positive leadership combined with able and proper management of the command aviation safety program ensures the reinforcement of the following three program functions:

1. Hazard detection
2. Hazard elimination
3. Safety education and awareness

### **Hazard Detection**

We accomplish hazard detection most often at the squadron level. However, the Aviation Safety Program requires that command aviation safety programs at all levels include methods for hazard detection.

Hazards exist as a result of poor design, improper or unprofessional work or operational practices, and inadequate training or preparation for a task or mission. Other causes of hazards include inadequate instructions or publications or a demanding and unforgiving environment. Each member of the command must support a program of reduced risks by reporting hazards.

### **Hazard Elimination**

The keys to effective hazard elimination are knowledge, required procedures and reporting instructions, proper use of materials and equipment, and safety awareness. As hazard detection is an all-hands effort, so too is hazard elimination. You can readily identify some hazards and correct them on the spot. Others, however, are more difficult to identify. We accomplish hazard elimination through remedial action to correct hazards. This action is divided into the following three parts:

1. Reporting of hazards
2. Remedial action to correct hazards
3. Monitoring of corrective actions

### **Safety Education and Awareness**

Each command aviation safety program must include a safety education and awareness program to provide safety training and to enhance safety awareness. Safety education provides routine safety training covering all safety subjects, including aeromedical, as well as formal U.S. Navy aviation and related safety courses. Safety education provides training on how to

properly identify, report, and correct hazards. It also provides training on properly managing safety information, which involves its collection, circulation, and control.

## **ELEMENTS OF THE COMMAND AVIATION SAFETY PROGRAM**

Setting up a proper aviation safety climate is required for a successful aviation safety effort. The commanding officer creates a set of command safety goals and standards and sets up a means of enforcing those standards. In addition, he or she creates an environment that will enhance safety hazard detection and elimination and promote safety education, training, and awareness programs. The following elements of the command aviation safety program are vital to a successful safety effort:

- **Command climate**—The commanding officer must foster a climate that promotes the goal of the command aviation safety program. He or she establishes the goal, monitors achievements of the program, and sets the standards.

- **Command safety goals**—The commanding officer establishes a clear set of aviation safety goals and an aviation safety policy. The policy defines what the commander expects of command personnel to attain these goals.

- **Command safety organization**—The commanding officer must issue a description of the command safety organization and the tasks or functions of each member of the command safety organization. The flight surgeon or wing flight surgeon serving the command is responsible for the aeromedical aspects of the command safety program.

- **Aviation Safety Council**—If the command is a squadron, an air station, or a larger activity, the command must form an Aviation Safety Council. The council sets goals, manages assets, and reviews safety-related recommendations. The council keeps records of the meetings it holds. Members of the council review command plans, policies, procedures, conditions, and instructions to make sure they are current and correct. The council also responds to corrective recommendations. Standing members of the council include aviation, ground, and aeromedical (flight surgeon) safety officers.

- **Enlisted Aviation Safety Committee**—Representatives from each work center and other designated activities, such as the Medical Department and Aircraft

Intermediate Maintenance Department (AIMD), form the Enlisted Aviation Safety Committee. The committee meets once a month to discuss safety deficiencies and provide recommendations for improved safety practices and promotion of safety awareness. The committee keeps a record of attendance and subjects discussed at the meetings. The commanding officer responds to all recommendations of the committee in writing and in a timely manner.

Each activity safety petty officer/noncommissioned officer should complete the personnel qualification standards (PQS) for *Aviation Safety PO/NCO*, NAV-EDTRA 43218.

### **Safety Standdown**

The command may conduct periodic safety standdowns devoted to providing dedicated time for safety training and awareness. In addition, safety stand-downs enhance the command safety climate.

### **Safety Surveys**

To measure the command's safety posture, the command should conduct periodic safety surveys. They may consist of in-house safety surveys conducted by unit personnel. The surveys also may consist of external services provided by a sister aviation activity, a wing, or a higher staff. The survey might be a formal survey by the NAVSAFECEN survey team. The recommended frequency of formal NAVSAFECEN surveys is every 2 years.

### **Safety Training**

The command must conduct and document periodic safety training within the command. The command makes sure personnel attend required formal safety training courses. Those who are unable to attend must request a waiver from higher authority.

### **Investigation of Suspected Hazards and Reporting Requirements**

The command must investigate and determine recommended corrective action on all hazards discovered or reported. The command must report hazards as required by OPNAVINST 3750.6Q, OPNAVINST 4790.2E, and other applicable directives. Reporting of hazards contributes to safety and hazard awareness. Reporting of hazards also helps in obtaining corrective action and improves procedures, processes, and materials.

## **General Safety**

The command should make sure it effectively covers programs in general safety, such as hearing conservation, flight deck/flight line safety, traffic safety, home safety, and hazardous materials.

### **SHIPBOARD AIRCRAFT SAFETY**

Flight decks are hazardous, and their danger to personnel goes beyond the chance of crashes. Exhausts on jet engines can propel personnel into other objects or over the side of the ship. Propellers and rotor blades can maim or kill. Aircraft carry ordnance and fuel that can cause fires and explosions. Moving aircraft can hit personnel. The ship pitches and rolls. For those reasons, all personnel whose job requires them to work on the flight deck must be constantly alert and aware of all dangers to avoid injury or death.

Flight line safety precautions, discussed later, apply to flight deck operations. The primary difference is the limited space and tempo of operations experienced on the flight deck. The flight deck is increasingly more dangerous.

All personnel assigned flight quarters on or above the hangar deck must wear appropriate jerseys and helmets. Personnel on the flight deck during flight quarters must wear the following equipment:

- A cranial impact helmet or its equivalent
- Goggles
- Sound attenuators
- Flight deck shoes
- Flotation gear
- An adequately secured whistle
- A survival light

### **FOREIGN OBJECT DAMAGE**

Engines can suck up loose objects from the deck or area around the intake. That can cause costly foreign object damage (FOD) or complete loss of the engine. Personnel must inspect the deck and other areas for FOD by conducting FOD walkdowns before beginning air operations or when starting engines for maintenance. Flight deck personnel must not put loose objects in shirt pockets and must keep their shirt pockets buttoned while they are in a flight operations area. FOD prevention is one of the reasons we prohibit the dumping of trash and garbage during launch and recovery operations.

## **LINE AND FLIGHT DECK SAFETY PRECAUTIONS**

You must observe several miscellaneous safety precautions when working on the aircraft flight line and the carrier flight deck. The following precautions are of special importance to ensure your safety as well as the safety of your co-workers.

### **Propellers and Rotors**





The first general precaution you must observe when working on the line around propeller-driven aircraft or helicopter rotors is to **BEWARE OF PROPELLERS**. When you see a propeller, let it be a constant reminder to **STAY CLEAR!** In general, do not cross in front of moving propellers, as whirling propellers are not easily seen. A good habit is to always walk around propellers. Keep the area around the aircraft clear of loose gear and debris.

### **Intake Ducts**

Maintenance of jet engines presents several major hazards. The air intake duct of operating jet engines represents an ever-present hazard. It is a hazard both to personnel working near the inlet duct of the aircraft and to the engine itself if the turn-up area around the front of the aircraft is not kept clear of debris. Jet engines will “eat” anything, and they have no respect for life or limb. This hazard is, of course, greatest during maximum power settings (high-power turn-up).

The air inlet duct may develop enough suction to pull hats, eyeglasses, loose clothing, and rags from pockets. Personnel should properly secure or remove all loose articles before working around operating jet engines. In some engines, the suction is strong enough to pull a person up to or, in some cases, into the inlet and pull the person’s eyeballs out. Needless to say, personnel must take every precaution to keep clear of the intakes.

Protective screens are supplied as part of the ground-handling equipment for most jet aircraft. These screens should be installed before maintenance turn-ups. The use of turn-up screens protects both personnel and engines. It does **NOT** eliminate the need for caution; a person can receive serious injury as a result of being pulled against the screen. Small items can be pulled through the screen, resulting in thousands of dollars of damage to the engine.

			
UNIVERSAL-FIT EARPLUG	EARPLUG V-51-R TYPE OR SIMILAR TYPES	TYPICAL EARMUFF	FLIGHT DECK SOUND-ATTENUATING HELMET (INCLUDES EARMUFFS)

#### WARNING

- EARPLUGS AND EARMUFFS SHALL BE WORN TOGETHER WHEN PERFORMING ENGINE RUN-UP.
- IF ENGINES ARE RUN UP IN FRONT OF BLAST DEFLECTOR, EXHAUST JET WAKE AND SOUND SHALL BE DIRECTED UP AND TO THE SIDES, RESULTING IN DISTORTION TO CONTOUR PATTERNS SHOWN.
- AT MAXIMUM POWER, TF30-P-412A AFTERBURNERS ARE AT MAXIMUM NOZZLE OPENING (ZONE 5). AT MILITARY POWER, THE NOZZLES ARE FULLY CLOSED (MINIMUM OPENING).

Figure 8-3.—Ear-protective devices.

### Exhaust Area Hazards

Jet engine exhaust creates several hazards. Tests show that while the carbon monoxide content of jet exhaust is low, other gases are present that are imitating to the eyes. Less noticeable, but as important, is the respiratory irritation exhaust fumes may cause.

The two most important hazards of jet engine exhaust are the high temperature and high velocity of the exhaust gases from the tail pipe. You can find high temperatures up to several hundred feet from the tail pipe, depending on wind conditions. Closer to the aircraft, temperatures are high enough to damage asphalt pavement.

When a jet engine is started, excess fuel accumulates in the tail pipe. When the fuel ignites, long flames can be blown out the tail pipe. Flight line personnel should know the possibility of this hazard. They should keep all flammable materials clear of the danger area.

During maximum power settings, the high velocity of the exhaust gases may pick up and blow loose dirt, sizable rocks, sand, and debris several hundred feet. that creates an eye and FOD hazard. Therefore, you should use caution when parking an aircraft for run-up. The general information section of the applicable maintenance instruction manual (MIM) contains

information about exhaust area hazards. These instructions should be strictly adhered to. **NO ONE SHOULD FOOLISHLY EXPERIMENT WITH THE SPECIFIED SAFETY MARGINS.**

After engine operation, no work should be done to the exhaust section for at LEAST ONE-HALF HOUR (preferably longer). If work is required immediately, personnel must wear heat-resistant gloves.

### Engine Noise

Jet engines produce noise capable of causing temporary as well as permanent loss of high-frequency hearing. On the flight line, noise levels can exceed 150 decibels (dB). When working around jet engines, you should take the following precautions to protect your hearing:

- Report on time for your annual or periodic audiograms.
- Do not exceed the directed time limits on exposure to the various sound intensities.
- Wear the proper ear protection, such as earplugs or sound attenuators (fig. 8-3). If double hearing protection is specified, wear earplugs under your cranial earmuffs.

Damage to hearing occurs when you expose your ears to high sound intensities for excessive periods. The higher the sound intensity, the shorter the period of exposure that will produce damage. As stated in an earlier chapter, exposures above an 84-dB(A) sound intensity, without hearing protection, can cause hearing damage.

The wearing of approved earplugs or sound attenuators will protect you from hearing loss. In extremely high noise level areas, such as the flight line, even double protection may not be enough protection. In such cases, time limits are set for allowable exposures to noise. Wearing hearing protection can raise the limits of time exposure. All personnel working within danger areas should be familiar with calculated decibel levels (as specified in the applicable maintenance instruction manual) and should wear the required protective equipment.

### **Movable Surface Hazards**

Movable surfaces such as flight control surfaces, speed brakes, power-operated canopies, and landing gear doors are a major hazard to flight line personnel.

These units are normally operated during ground operations and maintenance. Therefore, you should ensure that all personnel and equipment are clear of the area before operating any movable surface.

## **SUMMARY**

In this chapter, we addressed the scope and goal of the Naval Aviation Safety Program. We covered the concepts and individual responsibilities associated with the safety program. We discussed the command aviation safety program functions and its elements. We examined hazard reports, naval aircraft mishap reports, and mishap investigation reports. We considered the endorsements required on both hazard reports and mishap investigation reports. We examined general shipboard aircraft safety. Finally, we discussed the importance of monitoring mishap corrective actions.

We did not intend for this chapter to make you an expert in naval aviation safety. The chapter was developed to provide you with a basic introduction to aviation safety as well as the references you should consult for additional information.

